What Is Claimed Is:

1.   A method for receiving multiple streams of Internet Protocol (IP) packets that are interleaved together into a single stream of transport packets, comprising:

receiving the single stream of transport packets, wherein the single stream of transport packets includes multiple streams of IP packets that converted into transport protocol packets and are then interleaved together into the single stream of transport packets;

using the single stream of transport packets to reassemble IP packets for the multiple streams of IP packets within a single IP packet buffer;

keeping track of the order in which reassembly is completed for IP packets within the single IP packet buffer;

reading the IP packets out of the single IP packet buffer in the order in which reassembly is completed; and

forwarding the reassembled IP packets to their destinations as specified by IP addresses contained in the IP packets.

2.   The method of claim 1, wherein keeping track of the order in which reassembly is completed involves maintaining a circular buffer containing pointers to completed IP packets in the single IP packet buffer, wherein a pointer to a completed IP packet is entered into the circular buffer upon completion of the IP packet.

3.   The method of claim 2, wherein reading the IP packets out of the single IP packet buffer in the order in which packets are completed involves:

3   advancing a buffer pointer around the circular buffer containing pointers to

4 completed IP packets; and

5   reading the completed IP packets through pointers that are pointed to by

6 the buffer pointer;

7   whereby the completed IP packets are read out of the single IP packet

8 buffer in the order in which they were completed.

1   4. The method of claim 1, wherein the single IP packet buffer is

2 organized as a circular buffer, wherein buffers for incoming IP packets are

3 appended to the end of the circular buffer.

1   5. The method of claim 1, wherein reassembling the IP packets from

2 the transport packets involves maintaining a write pointer into the single IP packet

3 buffer for each stream of IP packets, wherein each write pointer points to a packet

4 being reassembled for an associated stream of IP packets.

1   6. The method of claim 5, wherein each write pointer includes:

2   a start pointer that points to the start of a packet being received for the

3 associated stream within the single IP packet buffer;

4   a number of bytes received so far for the packet being received; and

5   logic that calculates the write pointer from the start pointer and the number

6 of bytes received so far.

1   7. The method of claim 1, wherein using the single stream of

2 transport packets to reassemble IP packets involves:

3   receiving a single transport packet that includes an end section of a first IP

4 packet and a beginning section of a second IP packet;

5   directing the end section of the first IP packet to a first location in the

6   single IP packet buffer where the first IP packet is being reassembled; and

7   directing the beginning section of the second IP packet to a second

8   location in the single IP packet buffer where the second IP packet is being

9   reassembled.

1   8.   The method of claim 1, wherein the single stream of transport

2   packets includes MPEG2 transport packets.

1   9.   The method of claim 1, wherein reassembling IP packets involves

2   filtering transport packets based upon packet identifiers (PIDs) to filter out

3   transport packets containing data that is not of a specified type for the IP packets.

1   10.   The method of claim 1, wherein reassembling IP packets involves

2   checking continuity for transport packets to ensure that all transport packets that

3   make up an IP packet are received in sequential order.

1   11.   The method of claim 1, further comprising, filtering IP packets

2   based upon media access control (MAC) addresses to filter out IP packets that are

3   not directed to an IP destination address on a local network.

1   12.   The method of claim 1, wherein the single stream of transport

2   packets is received from a satellite.

1   13.   An apparatus that is configured to receive multiple streams of

2   Internet Protocol (IP) packets that are interleaved together into a single stream of

3   transport packets, comprising:

19

4   a receiver that is configured to receive the single stream of transport

5   packets, wherein the single stream of transport packets includes multiple streams

6   of IP packets that converted into transport protocol packets and are then

7   interleaved together into the single stream of transport packets;

8   a single IP packet buffer in which IP packets are reassembled;

9   a reassembly mechanism that is configured to reassemble IP packets for

10   the multiple streams of IP packets from the single stream of transport packets;

11   an ordering mechanism that is configured to keep track of the order in

12   which reassembly is completed for IP packets within the single IP packet buffer;

13   a reading mechanism that is configured to read the IP packets out of the

14   single IP packet buffer in the order in which reassembly is completed; and

15   a forwarding mechanism that is configured to forward the reassembled IP

16   packets to their destinations as specified by IP addresses contained in the IP

17   packets.

1   14.   The apparatus of claim 13,

2   wherein the ordering mechanism includes a circular buffer containing

3   pointers to completed IP packets in the single IP packet buffer; and

4   wherein the ordering mechanism is configured to enter a pointer to a

5   completed IP packet into the circular buffer upon completion of the IP packet.

1   15.   The apparatus of claim 14, wherein the reading mechanism is

2   configured to:

3   advance a buffer pointer around the circular buffer containing pointers to

4   completed IP packets; and to

5   read the completed IP packets through pointers that are pointed to by the

6   buffer pointer;

20

7   whereby the completed IP packets are read out of the single IP packet

8   buffer in the order in which they were completed.

1   16.   The apparatus of claim 13, wherein the single IP packet buffer is

2   organized as a circular buffer, wherein buffers for incoming IP packets are

3   appended to the end of the circular buffer.

1   17.   The apparatus of claim 13, wherein the reassembly mechanism

2   includes a write pointer into the single IP packet buffer for each stream of IP

3   packets, wherein each write pointer points to a packet being reassembled for an

4   associated stream of IP packets.

1   18.   The apparatus of claim 17, wherein each write pointer includes:

2   a start pointer that points to the start of a packet being received for the

3   associated stream within the single IP packet buffer;

4   a number of bytes received so far for the packet being received; and

5   logic that calculates the write pointer from the start pointer and the number

6   of bytes received so far.

1   19.   The apparatus of claim 13, wherein the reassembly mechanism is

2   configured to:

3   receive a single transport packet that includes an end section of a first IP

4   packet and a beginning section of a second IP packet;

5   direct the end section of the first IP packet to a first location in the single

6   IP packet buffer where the first IP packet is being reassembled; and to

7   direct the beginning section of the second IP packet to a second location

8   in the single IP packet buffer where the second IP packet is being reassembled.

1   20.   The apparatus of claim 13, wherein the single stream of transport

2   packets includes MPEG2 transport packets.

1   21.   The apparatus of claim 13, wherein the reassembly mechanism

2   includes a packet identifier (PID) filter that is configured to filter transport packets

3   based upon packet identifiers (PIDs) in order to filter out transport packets

4   containing data that is not of a specified type for the IP packets.

1   22.   The apparatus of claim 13, wherein the reassembly mechanism

2   includes a continuity checker that is configured to check continuity for transport

3   packets to ensure that all transport packets that make up an IP packet are received

4   in sequential order.

1   23.   The apparatus of claim 13, further comprising, media access

2   control (MAC) filter that is configured to filter IP packets based upon MAC

3   addresses in order to filter out IP packets that are not directed to an IP destination

4   address on a local network.

1   24.   The apparatus of claim 13, wherein the single stream of transport

2   packets is received from a satellite.

22